REMARKS

Currently, Claims 14-61 and 63-83 are pending in the application. Claims 1-13 have been previously canceled. Claims 14-61 and 63-83 have been examined and stand rejected. Reconsideration of Claims 14-61 and 63-83 is respectfully requested.

The previous rejection in view of Yamaguchi et al. (JP3-98632) has been withdrawn. A new rejection is made in view of Mushiake (U.S. Patent No. 6,242,135) and Pintauro et al. (U.S. Patent No. 6,365,294), under sections 102(e) and 103(a).

The Rejection of Claims 14-40, 42-47, 49-60, and 68-83 Under 35 U.S.C. § 102(e)

Claims 14-40, 42-47, 49-60, and 63-83 are rejected under 35 U.S.C. § 102(e) as being anticipated by Mushiake (U.S. Patent No. 6,242,135).

Claims 14, 24, 31, 38, 39, 42, 49, 58, 59, 60, 66, 72, and 77 are the independent claims.

Claims 14, 24, 31, 38, 42, 58, and 60 recite one end of a molecule of the graft polymer is bound to a surface of the pore.

For a reference to be anticipatory, the reference must exactly describe the claimed invention. Because Mushiake does not describe wherein one end of the graft polymer is bound to a surface of a pore, the reference is not anticipatory.

Accordingly, a withdrawal of the rejection of Claims 14, 24, 31, 38, 42, 58, and 60, and their dependent claims, is respectfully requested.

The aspect of one end of a molecule of the graft polymer being bound to a surface of the pore is neither taught nor remotely suggested by Mushiake. This aspect of the claimed invention can provide several advantages. For example, methanol crossover is reduced since the polymer cannot be released from the pore. A further advantage is that the membrane exhibits high proton conductivity because of binding a graft polymer having high proton conductivity directly to a surface of the pore.

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Mushiake does not describe or teach the above-mentioned aspect or advantages. Mushiake, at most, describes that porous PTFE (polytetrafluoroethylene) is used as one of the materials for a solid electrolyte composite, and that an ion exchange resin merely fills in the pores. However, Mushiake does not describe nor teach that the ion exchange resin is bound to a surface of the pore of the porous PTFE. Furthermore, Mushiake does not teach or suggest the above-mentioned advantages.

Claims 39, 59, and 77 recite wherein the electrolyte has the ability to prevent methanol permeation at a temperature of 130°C or higher. Claims 39 and 59 are directed to a fuel cell that include the electrolyte sandwiched between a cathode and anode. Claim 77 is directed to the electrolyte membrane.

For a reference to be anticipatory, the reference must exactly describe the claimed invention. Because Mushiake does not describe or teach wherein the electrolyte has the ability to prevent methanol permeation at a temperature of 130°C or higher, the reference is not anticipatory.

Accordingly, the withdrawal of the rejection of Claims 39, 59, and 77, and their dependent claims, is respectfully requested.

Claim 49 is directed to a method of manufacturing a fuel cell. Claim 49 recites, applying a sol to a first electrode; forming a porous thin layer from the applied sol; and filling a polymer in pores of the porous thin layer to form an electrolyte membrane on the first electrode.

In direct contrast to Claim 49, Mushiake merely describes a method for preparing an electrolyte, that includes applying silica sol to PTFE, and the formation of the electrolyte. Mushiake does not describe or teach how to form an electrolyte membrane on an electrode.

For a reference to be anticipatory, the reference must exactly describe the claimed invention. Because Mushiake does not describe a method for manufacturing a fuel cell,

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including applying a sol to a first electrode, forming a porous thin layer from the applied sol; and filling a polymer in pores of the porous thin layer to form an electrolyte membrane on the first electrode, the reference is not anticipatory.

Furthermore, Mushiake does not teach or remotely suggest the invention defined by Claim 49.

Accordingly, the withdrawal of the rejection of Claim 49 and its dependent claims is respectfully requested.

Claim 66 has been amended to recite "wherein the porous substrate consists essentially of an inorganic material selected from the group consisting of ceramics and glass."

Mushiake describes using PTFE-silica gel composite as a porous substrate. Mushiake uses organic material, i.e., PTFE (PTFE-silica gel composite) as a porous substrate. For a reference to be anticipatory, the reference must exactly describe the claimed invention. Because Mushiake does not describe wherein the porous substrate consists essentially of an inorganic material selected from the group consisting of ceramics and glass, the reference is not anticipatory.

Furthermore, Mushiake does not teach or remotely suggest the invention defined by Claim 66.

Accordingly, the withdrawal of the rejection of Claim 66 and all of its dependent claims is respectfully requested.

Claim 72 has been amended to recite polytetrafluoroethylene having a pore diameter of 0.1 micrometer or less.

For a reference to be anticipatory, the reference must exactly describe the claimed invention. Mushiake describes using PTFE-silica gel composite as a porous substrate in Example 1, in which PTFE has a pore diameter of 0.5 micrometer. Since the pore diameter used

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in Example 1 of Mushiake does not fall within the range of the invention defined by Claim 72, i.e., a pore diameter of 0.1 micrometer or less, the reference is not anticipatory.

Furthermore, Mushiake does not teach or remotely suggest the invention as defined by Claim 72.

Accordingly, the withdrawal of the rejection of Claim 72 and its dependent claims is respectfully requested.

The Rejection of Claims 14-61 and 63-83 Under 35 U.S.C. § 103(a)

Claims 14-61 and 63-83 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mushiake (U.S. Patent No. 6,242,135) in view of Pintauro et al. (U.S. Patent No. 6,365,294).

As an initial matter, applicants respectfully point out that the present application has a priority date of March 8, 1999. The present application is the national phase of PCT/JP00/01370, filed on March 7, 2000, that claims priority to Japanese Application No. 11-60817, filed March 8, 1999. An English translation of the priority document (Japanese Application No. 11-60817) is provided.

As understood, Pintauro et al. is used for teaching electrolytic membranes may be used in direct methanol fuel cells.

Claims 41, 48, and 61 recite, "direct methanol polymer fuel cell."

The translation of the priority document discloses a direct methanol polymer fuel cell on page 5, lines 6-7. Applicants submit that obviousness requires a reference to predate the priority date. Because Pintauro et al. does not predate the application priority date, Claims 41, 48, and 61 cannot be obvious in view of Mushiake, either alone, or combined with Pintauro et al. .

The Examiner further states that Pintauro et al. teaches the aspect of "protonic conductivity." However, the translation of the priority document discloses on page 6, para. [0011], this aspect as well. Claims 14-48, and 58-83, all recite the aspect of proton conduction.

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Accordingly, Claims 14-48, and 58-83, are entitled to a priority date that predates Pintauro et al. Therefore, Claims 14-48, and 58-83, are not obvious in view of Mushiake and Pintauro et al.

Claim 49 is directed to a method of manufacturing a fuel cell. Claim 49 recites, applying a sol to a first electrode; forming a porous thin layer from the applied sol; and filling a polymer in pores of the porous thin layer to form an electrolyte membrane on the first electrode.

In direct contrast to Claim 49, Mushiake merely describes a method for preparing an electrolyte, that includes applying silica sol to PTFE, and the formation of the electrolyte. Mushiake does not describe or teach how to form an electrolyte membrane on an electrode.

For obviousness, the references must teach or suggest all limitations of the claimed invention. Neither Mushiake nor Pintauro et al., alone or in combination, describe or teach a method for manufacturing a fuel cell, including applying a sol to a first electrode, forming a porous thin layer from the applied sol; and filling a polymer in pores of the porous thin layer to form an electrolyte membrane on the first electrode. Therefore, Claims 49-57 are not rendered obvious in view of Mushiake, either alone or combined with Pintauro et al..

Accordingly, the withdrawal of the rejection of Claims 49-57 is respectfully requested.

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CONCLUSION

In view of the foregoing amendments and remarks, applicants respectfully submit that Claims 14-61 and 63-83 are allowable. If the Examiner has any further questions or comments, the Examiner may contacts applicants' attorney at the number provided below.

Respectfully submitted,

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